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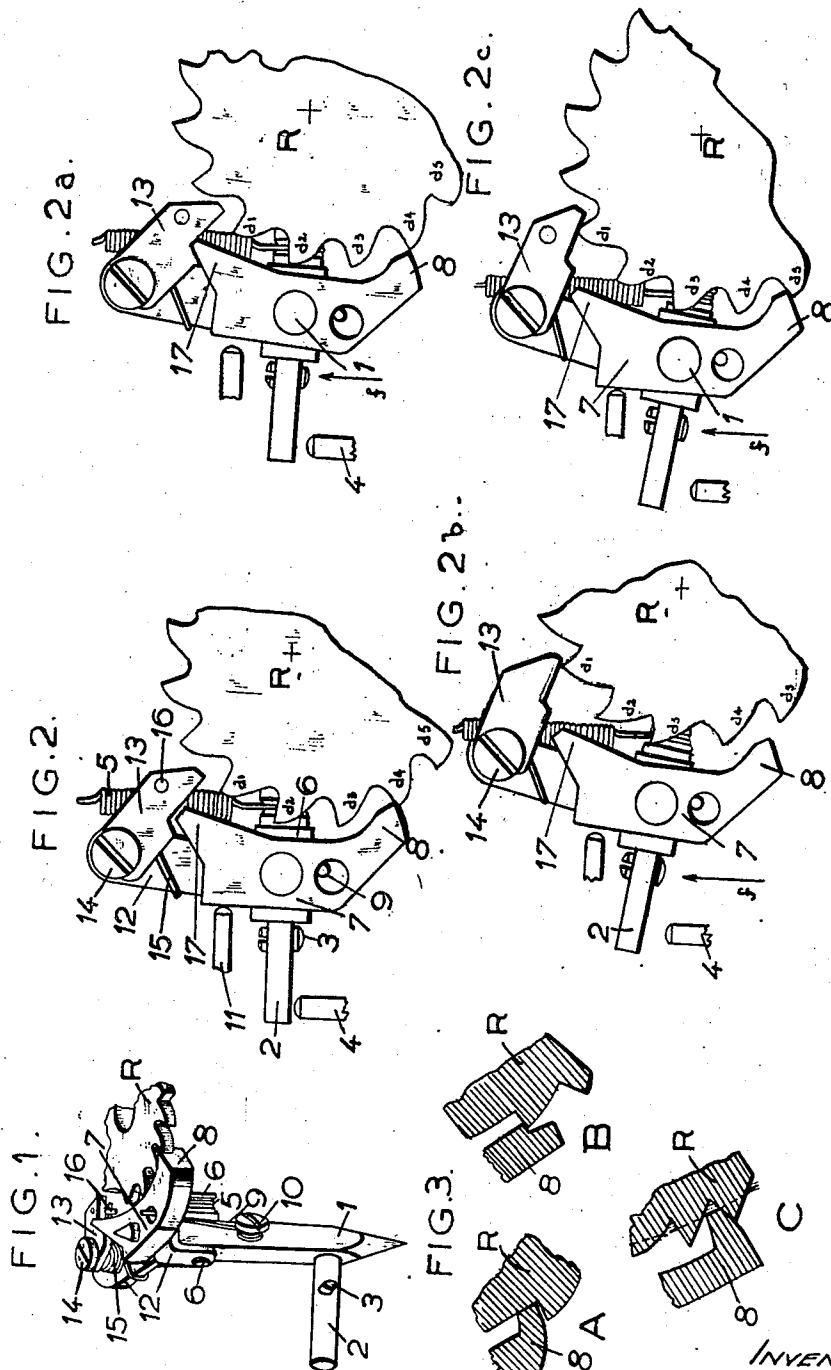
C. BALZEAU ET AL

2,551,234

ESCAPEMENT MECHANISM FOR TYPEWRITERS

Filed May 2, 1947

3 Sheets-Sheet 1



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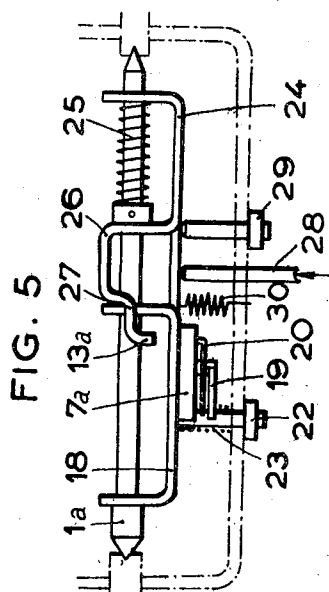
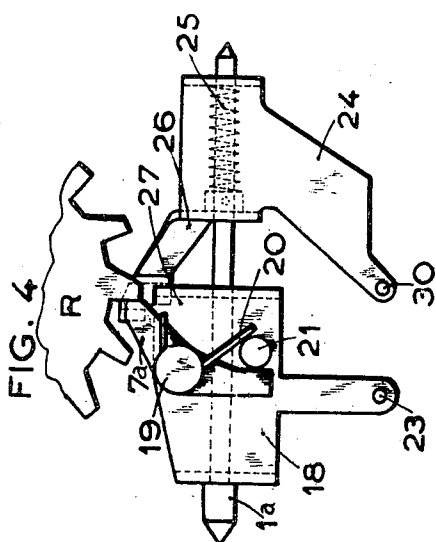
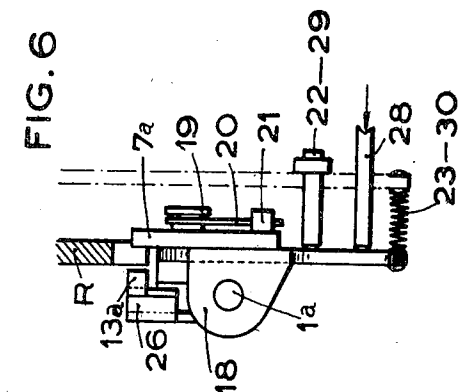
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ESCAPEMENT MECHANISM FOR TYPEWRITERS

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3 Sheets-Sheet 2



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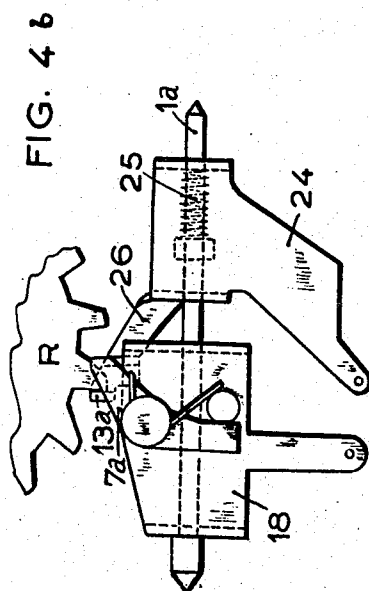
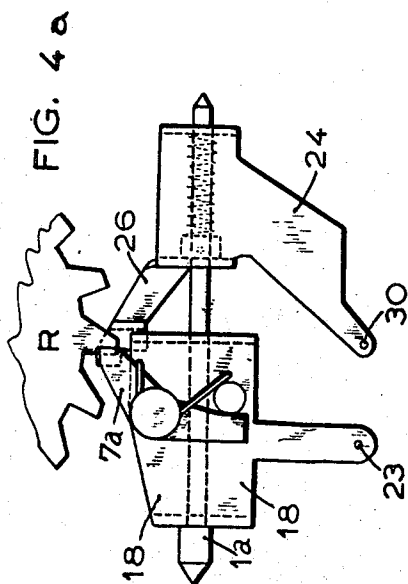
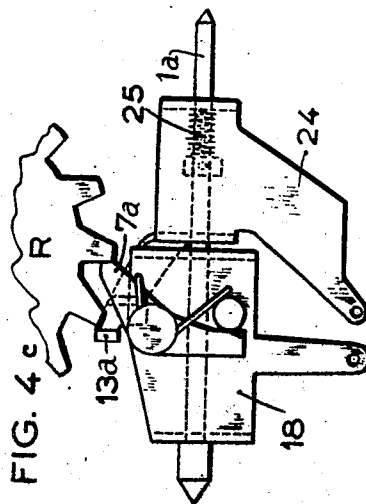
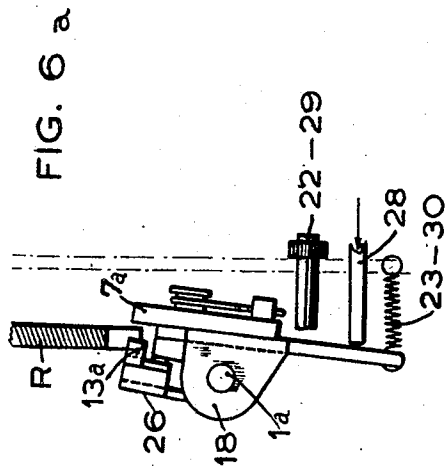
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2,551,234

ESCAPEMENT MECHANISM FOR TYPEWRITERS

Filed May 2, 1947

3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,551,234

ESCAPEMENT MECHANISM FOR
TYPEWRITERS

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Application May 2, 1947, Serial No. 745,548
In France May 22, 1946

7 Claims. (Cl. 197-86)

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Our invention has for its object an improved escapement mechanism for typewriters, said mechanism being specially designed in order that the shifting of the carriage of the typewriter after a key has been depressed, may be effected in a single stage so as to provide for a high degree of accuracy in the typing whatever may be the speed of typing.

Such a mechanism cooperates with the well-known arrangement wherein a traction band constantly urges the carriage forward together with a rack rigid therewith and thus constrains the escapement wheel to rotate through the agency of a pinion keyed to the axis of said wheel and in permanent mesh with the rack. This general arrangement is common to all typewriters and varies only as concerns the position of the escapement wheel that lies in a horizontal plane in certain cases and in a vertical plane in other cases.

The mechanism according to our invention is executed in a manner such that it is applicable in either of said cases and it shows thus two possible forms of execution to be described hereinafter separately by way of example, reference being made to accompanying drawings wherein:

Fig. 1 shows in the case of the horizontal escapement the whole of the mechanism in perspective view.

Figs. 2, 2a, 2b, and 2c are plan views of said mechanism illustrating four successive positions of the escapement period, while the carriage is moving through the interval corresponding to the space between two successive impressions.

Figs. 3A, 3B, and 3C are detail views.

Figs. 4, 5, and 6 show respectively in elevational, plan and side view a mechanism that is applicable for the case of a vertical escapement wheel.

Figs. 4a, 4b, and 4c are elevational views illustrating in association with Fig. 4, four successive positions of the escapement during an escapement period.

Fig. 6a is another side view corresponding to the position illustrated in elevational view in Fig. 4a.

In all said figures, the usual escapement wheel is designated by R.

As apparent from inspection of Figs. 1 and 2 the vertical spindle 1 of the mechanism is pivotally mounted at both ends and carries at its lower end a transverse bar 2 secured rigidly to it and provided with an adjusting screw 3; this bar may be rocked horizontally in the direction of the arrow f and its stroke is defined at the start by a stop 4; said bar provides for the control of

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the rotation of the support of the catches 7 and 13 described hereinafter. The spindle 1 is constantly urged back into its inoperative position by a spring 5 secured thereto by means of a screw 6 engaging said spring.

The escapement wheel is held in its inoperative position by a catch 7 adapted to rock with reference to the axis of spindle 1 or an axis aligned therewith; the tip 8 of said catch engages the teeth of the wheel R under the action of a spring 9 secured to the spindle 1, for instance through the agency of the screw 10, the engagement between the catch and the wheel being limited by an adjustable stop 11. The limitation of said engagement between the catch and the teeth of the wheel may also be obtained as shown by way of example in Fig. 3 in any of the three following manners: either as shown at A where the tip of the catch engages the bottom of the tooth on the wheel; or as shown at B where the tip of the catch bears against the outer ends of the teeth on the wheel; or as shown at C where the tip engages a disc rigid with the wheel and the radius of which has a value intermediary between the minimum and maximum radii of the escapement wheel.

On the other hand, a member 12 secured to the upper part of the spindle 1, for instance through the agency of the spring-engaging screw 6, carries the detent 13 adapted to rock round the securing screw 14, that serves also as an axis for the spring 15; the latter acts on the abutment stud 16 rigid with the detent and constantly urges the latter into its inoperative position, i. e. that illustrated in Fig. 2, wherein the detent 13 bears against the catch 7. Furthermore, the detent is shaped so as to provide at its point of contact with the catch a notch for housing the tail-piece 17 of the catch.

The operation of the mechanism thus described is as follows:

When the escapement is inoperative, the tooth d4 of the escapement wheel R is held back by the tip 8 of the catch, the engagement of which is limited as disclosed hereinabove. The spindle 1 is urged by the spring 5 but is stopped by the engagement of the stop 4 against the bar 2. This is, as a matter of fact, the position illustrated in Fig. 2.

At the moment of depressing a key, the universal bar acts, through the agency of a combination of suitable members that from no part of our invention, on the adjusting screw 3 on the small bar 2 so as to urge the latter in the direction of the arrow f whereby the spindle

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1 is caused to rock. Under the action of this rocking, the detent that is in contact with the tail-piece 17 of the catch 7, drives the latter away from the stop 11 and releases the tip 8 of the catch with reference to the tooth d4 of the wheel R with which it was precedingly engaged. This release is rendered possible through the fact that the pivoting of the spindle acts on the different members carried by the latter and thus the relative position of the catch with reference to the detent is not modified and the tail-piece 17 of the catch remains in contact with the notch or stop provided in the detent 13. On the other hand the rotation of said spindle 1 engages the detent inside the interval between the teeth of the escapement wheel. This position is that illustrated in Fig. 2a.

In Fig. 2b the wheel R is no longer held by the catch and rotates so that the tooth d1 drives the detent which latter rocks round its axis 14 and releases the tail-piece 17 of the catch 7. The catch is then no longer held by any abutment and rotates under the action of the spring 9 and its tip 8 drops into contact with the following tooth d5 that forms an abutment for it. The wheel is then stopped again as illustrated in Fig. 2c.

With reference to the typewriter as a whole, the catch 7 has thus resumed its original position and is again in the position shown in Fig. 2. At this moment the rearward motion of the universal bar discontinues the thrust that has been exerted on the small bar 2 in the direction of the arrow f and the spindle 1 subjected to the action of the return spring 5 pivots in the opposite direction, which releases the detent 13 with reference to the teeth of the escapement wheel and returns the mechanism as a whole into the inoperative position illustrated in Fig. 2.

Figs. 4—4c, 5, 6 and 6a relate to a mechanism that is applicable for the case of a vertical escapement wheel.

In said modification, the spindle 1a of the mechanism is horizontal and remains stationary; it serves as a pivot for a support 18 to which is pivoted a catch 7a held fast by a screw 19 that serves as an axis for a hair-pin shaped spring 20 through which the catch is urged against the stationary stop 21. This arrangement of a rotary catch 7a is necessary only for allowing the reverse rotation of the ratchet wheel R in the case of the carriage being returned back through one space or being returned into its starting position.

In its inoperative position, the support 18 bears against adjustable stop 22 against which it is consequently urged by the spring 23 (Figs. 5 and 6).

Next to said support 18 is arranged another member 24 adapted to pivot round the spindle 1a and also to move longitudinally over said spindle 1a, while an axial spring 25 constantly urges said member towards its original position which is that shown in Fig. 4. This member 24 is shaped in a manner such as to include an arm 26 which is of a special shape and passes inside a suitable notch 27 provided in the catch support 18; said member terminates at its upper end in a projection 13a playing the part of the detent of the preceding mechanism. The member 24 swivels round the spindle 1a under the action of the controlling rod 28 and through the particular arrangement of the arm 26 it may carry the support 18 along in its rotary move-

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ment. When inoperative, it bears against the adjustable stop 29 under the action of its radial return spring 30.

The operation is as follows:

In its inoperative position as illustrated in Figs. 4 to 6, the escapement wheel R is stopped by the catch 7a located substantially in the same vertical plane, while the projection 13a carried by the driving member 24 is located outside said plane, and the support 18 and driving member 24 are urged against the corresponding stops 22 and 29.

At the moment of typing and under the action of the universal bar, the control rod 28 is urged forwards and pushes the driving member with which it is in contact so as to make it rotate angularly or to rock round the spindle 1a; this movement is immediately transmitted as disclosed to the supporting member 18 and consequently to the catch 7a. This rocking of the mechanism as a whole serves to simultaneously release the catch with reference to the teeth of the wheel R and to engage the detent projection 13a between said teeth; this position is illustrated in Figs. 4a and 6a.

The driving member 24 the projection 13a of which is thus engaged with the escapement wheel that is now capable of rotating, slides over the spindle 1a while compressing the axial spring 25 and then releases the support 18 which is urged by the return spring 23 and constrains the catch to bear against the side of the teeth of the wheel R as apparent from Fig. 4b; as soon as under the action of the continuation of the rotation of the wheel R the catch may drop into the hollow of the next tooth as illustrated in Fig. 4c, the support 18 returns into its inoperative position and bears against the stop 22.

The typing being at an end, the control rod 28 returns backwards and the driving member 24 subjected to the action of its radial return spring 30 may then laterally disengage the projection 13a with reference to the teeth of the wheel and bear against the stop 29; at the same time the axial return spring 25 expands and returns the member 24 into its original inoperative position. The mechanism is thus set and is ready for a further escapement operation.

What we claim is:

1. An escapement mechanism for typewriters, comprising an escapement wheel, a catch adapted to engage the teeth of said escapement wheel, a spring urging said catch into engagement with the wheel, a pivoting detent engaging said catch, a control bar adapted to make said detent rock for releasing the catch with reference to the wheel and engaging in its turn the wheel, to then be driven along by the wheel for disengaging the catch and allowing same to reengage the wheel teeth, a spring acting in antagonism with the movement of the escapement wheel urging the detent into engagement with the catch, and a spring acting in antagonism with the control bar for returning the detent back into its inoperative position.

2. An escapement mechanism for typewriters comprising a horizontal escapement wheel, a pivoting vertical spindle, a control bar rigid therewith, a stationary stop, a spring urging the control bar against its stop, a catch adapted to pivot round said spindle, a spring urging the catch into engagement with the teeth of the escapement wheel, a detent engaging said catch,

a member rigid with the spindle forming a sup-

porting pivot for the detent and a spring urging the detent into contact with the catch.

3. An escapement mechanism for typewriters comprising a horizontal escapement wheel, a pivoting vertical spindle, a control bar rigid therewith, a stationary stop, a spring urging the control bar against its stop, a catch adapted to pivot round said spindle, a spring urging the catch into engagement with the teeth of the escapement wheel, a detent engaging said catch, an adjustable stop limiting the stroke of the catch at the point corresponding to engagement of its outer end with the bottom of the interval between two teeth of the wheel, a member rigid with the spindle forming a supporting pivot for the detent and a spring urging the detent into contact with the catch.

4. An escapement mechanism for typewriters comprising a horizontal escapement wheel, a pivoting vertical spindle, a control bar rigid therewith, a stationary stop, a spring urging the control bar against its stop, a catch adapted to pivot round said spindle, a spring urging the catch into engagement with the teeth of the escapement wheel, a detent engaging said catch, an adjustable stop limiting the stroke of the catch at the point corresponding to engagement of its outer end with the outer parts of the teeth of the wheel, a member rigid with the spindle forming a supporting pivot for the detent and a spring urging the detent into contact with the catch.

5. An escapement mechanism for typewriters comprising a horizontal escapement wheel, a pivoting vertical spindle, a control bar rigid therewith, a stationary stop, a spring urging the control bar against its stop, a catch adapted to pivot round said spindle, a spring urging the catch into engagement with the teeth of the escapement wheel, a detent engaging said catch, a disc rigid with and coaxial with the escapement wheel and adapted to engage through its periphery the outer end of the catch, the radius of said disc being comprised between the maximum and minimum radii of the escapement wheel, a member rigid with the spindle forming a supporting pivot for the detent and a spring urging the detent into contact with the catch.

6. An escapement mechanism for typewriters comprising a vertical escapement wheel, a horizontal stationary spindle, two members adapted to rotate side by side on said spindle, of which one is recessed and the other is adapted to slide

over the spindle, adjustable stationary stops, springs urging each of said members against the corresponding stop, a catch carried by the first member and adapted to engage the wheel in a predetermined angular position of the first member with reference to the spindle, an arm rigid with the second member and adapted to engage the recess in the first member, a detent on said arm adapted to engage the wheel in a predetermined angular position of the second member with reference to the spindle, the rotation of the wheel when engaged by the detent releasing the two members with reference to one another, an axial spring urging the second member towards the first member and means for controlling the angular position of the second member.

7. An escapement mechanism for typewriters comprising a vertical escapement wheel, a horizontal stationary spindle, two members adapted to rotate side by side on said spindle, of which one is recessed and the other is adapted to slide over the spindle, adjustable stationary stops, springs urging each of said members against the corresponding stop, a threaded spindle carried by the first member, a catch pivotally mounted on said spindle, a folded spring, a stationary stop on the first member against which the catch is urged by the last-mentioned spring, said catch being adapted to engage the wheel in a predetermined angular position of the first member with reference to the spindle, an arm rigid with the second member and adapted to engage the recess in the first member, a detent on said arm adapted to engage the wheel in a predetermined angular position of the second member with reference to the spindle, the rotation of the wheel when engaged by the detent releasing the two members with reference to one another, an axial spring urging the second member towards the first member and means for controlling the angular position of the second member.

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